

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 020209PC	FOR FURTHER ACTION See Form PCT/IPEA/416																									
International application No. PCT/SE 2003/001885	International filing date (day/month/year) 04.12.2003	Priority date (day/month/year) 23.12.2002																								
International Patent Classification (IPC) or national classification and IPC B21C 47/26, B21C 9/00																										
Applicant Sandvik AB et al																										
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>3</u> sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> (sent to the applicant and to the International Bureau) a total of <u>2</u> sheets, as follows:</p> <p><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p> <p>4. This report contains indications relating to the following items:</p> <table> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. I</td> <td>Basis of the report</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. II</td> <td>Priority</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. V</td> <td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table>			<input checked="" type="checkbox"/>	Box No. I	Basis of the report	<input type="checkbox"/>	Box No. II	Priority	<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	<input type="checkbox"/>	Box No. IV	Lack of unity of invention	<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	<input type="checkbox"/>	Box No. VI	Certain documents cited	<input type="checkbox"/>	Box No. VII	Certain defects in the international application	<input type="checkbox"/>	Box No. VIII	Certain observations on the international application
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Date of submission of the demand 14.06.2004	Date of completion of this report 04.11.2004
Name and mailing address of the IPEA/SE Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM Facsimile No. +46 8 667 72 88	Authorized officer Anders Brinkman/ELY Telephone No. +46 8 782 25 00

Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

This report is based on a translation from the original language into the following language _____, which is the language of a translation furnished for the purposes of:

international search (under Rules 12.3 and 23.1(b))
 publication of the international application (under Rule 12.4)
 international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on (replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):

the international application as originally filed/furnished

the description:

pages 1-8 _____ as originally filed/furnished

pages* _____ received by this Authority on _____

pages* _____ received by this Authority on _____

the claims:

pages _____ as originally filed/furnished

pages* _____ as amended (together with any statement) under Article 19

pages* 1-2 _____ received by this Authority on 29.10.2004

pages* _____ received by this Authority on _____

the drawings:

pages 1 _____ as originally filed/furnished

pages* _____ received by this Authority on _____

pages* _____ received by this Authority on _____

a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. The amendments have resulted in the cancellation of:

the description, pages _____
 the claims, Nos. _____
 the drawings, sheets/figs _____
 the sequence listing (specify): _____
 any table(s) related to the sequence listing (specify): _____

4. This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

the description, pages _____
 the claims, Nos. _____
 the drawings, sheets/figs _____
 the sequence listing (specify): _____
 any table(s) related to the sequence listing (specify): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-14	YES
	Claims		NO
Inventive step (IS)	Claims	1-14	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-14	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

Documents cited in the International Search Report:

D1: DE 3050507 C1
D2: GB 1446946 A
D3: JP 64-048619 A
D4: US 4062528 A

The cited documents represent the general state of the art.

The invention defined in claims 1-14 is not disclosed by any of these documents.

The cited prior art does not give any indication that would lead a person skilled in the art to the claimed method and arrangement. Therefore, the claimed invention is not obvious to a person skilled in the art.

Accordingly, the invention defined in claims 1-14 is novel and is considered to involve an inventive step. The invention is industrially applicable.

CLAIMS

1. A method of cooling strip or wire products in which, subsequent to being annealed, the product (3) is cooled to a temperature of about 20-50°C beneath its oxidation temperature, where by winding the product (3) around a drum (1) immediately downstream of an annealing path so that the product (3) will lie in mutual juxtaposed turns whereafter the product after a number of turns, is unwound from the drum (1), **characterised in** that the product is wound onto the drum (1) through a number of turns such that said product (3) will be cooled to a desired temperature, and wherein the drum (1) is given a diameter that exceeds the diameter at which the product (3) will be influenced mechanically by plastic deformation.
2. A method according to Claim 1, **characterised** by placing the drum (1) in a closed housing (2) that includes a product inlet opening (4) and a product outlet opening (5) and by causing a shielding gas atmosphere to be maintained in the housing (2).
3. A method according to Claim 2, **characterised** by using argon, hydrogen gas or nitrogen gas or corresponding shielding gases as the shielding gas atmosphere.
- 20 4. A method according to any one of Claims 1-3, **characterised** by cooling the drum (1) with the aid of a forced convection effect with its surrounding atmosphere.
5. A method according to any one of Claims 1-4, **characterised** by cooling the drum (1) with the aid of an external coolant which is caused to cool the inside (7) of the drum (1).
- 25 6. A method according to any one of Claims 1-5, **characterised** by constructing the drum (1) from a material that has good thermal conductivity, such as metallic material.
- 30 7. A method according to any one of the preceding Claims, **characterised** by driving the drum (1) with the aid of a drive motor.

AMENDED SHEET

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8. An arrangement for cooling strip or wire material products where the product is cooled to a temperature of about 20-50°C beneath the oxidation temperature of said product after having been annealed, **characterised** in that the product (3) is wound onto a drum (1) immediately downstream of an annealing path such that the turns of the product 5 (3) will be mutually juxtaposed, wherein the product is unwound from the drum (1) after having been wound onto the drum through a number of turns, wherein the number of turns on the drum (1) is such as to cool the product (3) to a desired temperature, and wherein the drum (1) has a diameter which exceeds the diameter at which the product (3) is influenced mechanically by plastic deformation.

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9. An arrangement according to Claim 8, **characterised** in that the drum (1) is located in a closed housing (2) that has an inlet opening (4) and an outlet opening (5) for the product (3); and in that the housing (2) contains and maintains a shielding gas atmosphere.

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10. An arrangement according to Claim 9, **characterised** in that the shielding gas atmosphere consists of argon, hydrogen gas or nitrogen gas or a corresponding shielding gas.

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11. An arrangement according to any one of Claims 8 to 10 inclusive, **characterised** in that the drum (1) is cooled with the aid of a forced convection effect from its surrounding atmosphere.

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12. An arrangement according to any one of Claims 8 to 11 inclusive, **characterised** in that the drum (1) is cooled with the aid of an external coolant which functions to cool the inside (7) of the drum (1).

13. An arrangement according to Claim 12, **characterised** in that the drum (1) is made of a material that has good thermal conductivity, such as metallic material.

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14. An arrangement according to any one of Claims 8 to 13 inclusive, **characterised** in that the drum (1) is motor-driven.

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